UNDP

UNITED NATIONS DEVELOPMENT PROGRAMME

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ENGLISH

APPROVAL OF UNDP ASSISTANCE TO A GLOBAL PROJECT
(GLO/91/016) - Biotechnology Assisted Breeding as a Tool to Reduce Pesticide Use in Potato Production (CIP)

Date of approval by the AC: 1/	29 January 1992
Expected duration:	Three years
Proposed executing agency:	UNDP
Proposed UNDP contribution:	$4 675 000
Source of funds:	Global IPF

Project background

The potato is the fourth major basic food crop in the world. It is grown in 94 developing countries of Asia, Africa and Latin America, producing over 67.5 million tons of food annually on about 5.7 million hectares. Production is rapidly expanding in most of these countries. Potato production in the developing world is constrained by a variety of physical and biological stresses., It is attached by more than 250 diseases and pests and is the heaviest user of synthetic chemical pesticides of all food crops. Farmers often protect their crop by routinely using synthetic chemical pesticides on a calendar basis.

In many developing countries, both women and men do potato cultivation, including spraying of synthetic chemicals and risking exposure to toxic pesticides. Furthermore, chemical dusting or spraying to protect potatoes in storage against pests such as tuber moth introduces synthetic chemicals into the diets of many households. The World Health Organization estimates that synthetic chemical pesticides poison three million people each year. One in fourteen dies. There is also much documentation that chemical pesticide contamination from cultivated crop lands is accumulating in groundwater, rivers and streams.

Description of project

A primary objective of the project is to incorporate resistance to major diseases and pests into agronomically desirable varieties. However, while conventional breeding can rapidly incorporate resistance that is governed by single gene, resistance that is controlled by several genes is much more difficult to incorporate. Thus, the use of advanced breeding techniques (tissue culture and RFLP mapping in particular) is essential to accelerate breeding for resistance to serious insect pests and diseases.

1/ This Fact Sheet reflects the status of the project/revision at the time it was approved by the Action Committee; modifications to the project/revision may have occurred subsequently.

The proposed research will focus on two genetic traits which will reduce the need and use of synthetic chemical pesticides: (1) late blight resistance; and (2) glandular trichomes. The former will provide a long-term protection against one of the most serious and economically important fungal diseases of the potato. The latter will provide broad-spectrum resistance to major insect pests and vectors of major diseases. Conventional breeding for both traits has produced promising breeding populations; and the entire process can now be rapidly advanced with the new breeding techniques.

Institutions in developing countries will participate in the proposed collaborative research for potato improvement. The Institute of Biotechnology and Microbiology in the Philippines, the Instituto de Biologia Molecular-INTA in Argentina, and other laboratories and scientists in the UNDP Latin American Biotechnology Network will contribute to the project. CIP will also collaborate with the Scottish Crop Research Institute and the Research Institute for Plant Protection (IPO) of the Netherlands to gain appropriate advanced knowledge on RFLP's and its application to [potatoes. Cornell University (USA) will assist in the cryogenic preservation of potato genotypes in order to provide long-term storage. Training of NARS scientists will be conducted on restriction fragment length polymorphism (RFLP) technology, tissue culture, breeding, germplasm exchange and testing through individual training, group courses, meetings and workshops. These advanced technologies will be available to interested NARS potato improvement programmes through the regional programme network.

Inputs

UNDP contribution will be used for training of developing country scientists and technicians, for technical sub-contracts to developed and developing country institutes in the Netherlands, United Kingdom, United States, the Philippines, Argentina and others in the Latin American Biotechnology Network and for support of research activities.

Financial data

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Personnel	1 044 000
Research	2 509 000
Training	720 000
Equipment	202 000
Direct cost*	200 000
Total	4 675 000

* For external review, end of project evaluation and consultation with interested developing country national programmes and FAP.

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